Journal Of Cardiovascular Disease Research
ISSN: 0975-3583,0976-2833 VOL14, ISSUE 12, 2023

Original Research

Evaluation Of The Impact Of Telemedicine On The Management Of Chronic Diseases: A Retrospective Analysis

[1]Dr. Krutarth Shukla, [2]Dr. Ishan Patel, [3]Dr. Nihar Gami, [4]Dr. Nayan Manish Gandhi,

[1]MBBS, Gujarat Cancer Society Medical College Hospital and Research Center, Ahmedabad, Gujarat. Ahmedabad, Gujarat. krutarth662@gmail.com
[2]MBBS, Smt. Nathiba Hargovandas Lakhmichand Municipal Medical College,Ahmedabad, Gujarat. ishan29897@gmail.com
[3]MBBS, Gujarat Cancer Society Medical College Hospital and Research Center, Ahmedabad, Gujarat. nihar.gami@gmail.com
[4]MBBS, Gujarat Cancer Society Medical College Hospital and Research Center, Ahmedabad, Gujarat. Ahmedabad, Gujarat. nayangandhi773@gmail.com

Corresponding Author:
Dr. Krutarth Shukla,
MBBS, Gujarat Cancer Society Medical College Hospital and Research Center, Ahmedabad, Gujarat. Ahmedabad, Gujarat. krutarth662@gmail.com

Received:22 November 2023 Accepted: 12 December 2023

Abstract
Introduction: Managing chronic illnesses presents substantial hurdles. Enhancing the treatment of chronic diseases through remote healthcare services is a potential approach provided by telemedicine. The purpose of this retrospective analysis is to determine how telemedicine interventions affect the management of chronic diseases by evaluating treatment adherence, health outcomes, and healthcare use.
Methods: Over a predetermined time period, patient records from the institution were examined. Patients with a range of chronic illnesses who had telemedicine treatments met the inclusion criteria. Information was gathered on health indicators, telemedicine modes, illness profiles, and demographics. Results from the pre- and post-telemedicine implementation phases were compared using statistical analysis.
Results: The use of telemedicine treatments led to a notable increase in treatment adherence as well as improvements in health outcomes (such as blood pressure and glucose management). Telemedicine has the ability to maximise resource utilisation, as demonstrated by healthcare utilisation measures such as decreased hospital visits and specialised consultations.
Conclusion: Telemedicine has great potential for bettering the treatment of chronic diseases, achieving better health outcomes, and lowering healthcare use. Notwithstanding several drawbacks, these results highlight the revolutionary potential of telemedicine in terms of giving people with chronic illnesses easily accessible and efficient care.
Keywords: Patient outcomes, healthcare management, telemedicine, chronic diseases, and remote interventions

Introduction

The number of people affected by chronic illnesses is increasing globally, impacting millions of people [1]. These disorders need ongoing patient involvement, care, and monitoring due to their protracted duration and frequently sluggish development [2]. Morbidity and mortality rates are greatly impacted by conditions including diabetes, cardiovascular disease, chronic respiratory illnesses, and mental health issues [3]. The inability of the conventional healthcare approach to offer complete and ongoing treatment for chronic illnesses has led to a search for novel remedies [4].

Telemedicine, which may be described as the distant provision of medical services using digital technology [5], has shown great promise in revolutionising the treatment of chronic illnesses. Telemedicine enables remote monitoring, patient education, consultations, and the delivery of healthcare by utilising telecommunications technology [5]. It has great promise for enhancing access to specialised treatment and bridging geographic gaps [4]. However, rigorous analysis and empirical data are needed to fully comprehend its influence on the management of chronic diseases.

The goal of this retrospective investigation is to evaluate the complex effects of telemedicine interventions on the management of chronic illnesses. This research aims to bring empirical data to the debate on the efficacy of telemedicine in managing the complexity of chronic illnesses by looking at patient outcomes, treatment adherence, healthcare utilisation, and patient satisfaction.

Material and methods

This retrospective analysis employed a systematic review of electronic health records from the tertiary care center spanning a specified period between the years 2015-2022. Patients with a range of chronic illnesses who had

telemedicine treatments as part of their therapy met the inclusion criteria. The process of gathering data involved carefully extracting patient demographics, disease profiles, the telemedicine modalities that were used (like video consultations, remote monitoring, or electronic messaging), the length of the interventions, and pertinent health indicators, like blood pressure readings, glycemic control, medication adherence, and the frequency of medical visits. Before and after the deployment of telemedicine interventions, statistical analyses, such as paired t-tests and regression models, were performed to assess changes in health outcomes, adherence to treatment regimens, and patterns of healthcare use. The objective of this methodological approach was to offer a thorough evaluation of the influence of telemedicine on the treatment of chronic illnesses.

Results

After telemedicine treatments were implemented, the analysis showed a substantial increase in health outcomes. Table 1 shows a significant drop in blood pressure readings from 130/80 to 125/75 ($p < 0.005$) and a mean glycemic level reduction from 7.2 (SD ± 0.6) to 6.8 (SD ± 0.5) ($p < 0.001$). Also, once telemedicine was used, medication adherence rose significantly from 78% to 85% ($p < 0.01$).

In terms of healthcare use (Table 2), there was a significant drop in ER visits and specialist consultations ($p < 0.005$ and $p < 0.01$, respectively), as well as a significant reduction in hospital visits from 1.5 to 0.8 per month ($p < 0.001$). These results highlight how telemedicine improves health outcomes and, as a result, lowers healthcare use among those with chronic illnesses.

Tables

Table 1: Comparison of Health Outcomes Before and After Telemedicine Intervention

Health Indicator	Before Telemedicine	After Telemedicine	p-value
Glycemic Control	7.2 (SD ± 0.6)	6.8 (SD ± 0.5)	<0.001
Blood Pressure (mmHg)	130/80	125/75	<0.005
Medication Adherence	78%	85%	<0.01

Table 2: Healthcare Utilization Before and After Telemedicine Implementation

Healthcare Metrics	Before Telemedicine	After Telemedicine	p-value
Hospital Visits (per month)	1.5	0.8	<0.001
Emergency Room Visits	0.6	0.3	<0.005
Specialist Consultations	2.2	1.5	<0.01

Discussion

The results of this retrospective investigation highlight how significantly telemedicine has improved the management of chronic illnesses. The health outcomes that have been seen to have improved, such as better blood pressure management, better glycemic control, and better medication adherence, are consistent with earlier research supporting the effectiveness of telemedicine [1][2]. These favourable alterations are important markers of improved disease control and lower risk of complications for those with long-term illnesses [3].

Telemedicine has the ability to relieve pressure on healthcare facilities, as seen by the notable decline in healthcare utilisation measures, including ER and hospital visits, as well as fewer specialist consultations [4]. Telemedicine helps to transform the paradigm in healthcare delivery by offering timely and easily accessible solutions. This encourages more effective resource allocation and may even lower total healthcare expenses [5].

Even while the results point to significant advantages, there are a few drawbacks that should be taken into account. Due to its retrospective design, the research has several inherent limitations, such as the possibility of selection bias and dependence on publicly available healthcare system data. Furthermore, the period of the trial could not have captured the long-term impacts of telemedicine treatments on the management of chronic illnesses. Extensive follow-up studies are required to evaluate the durability and sustainability of these noted advancements [6-8].

Furthermore, differences in digital literacy and technological availability may make telemedicine less successful and less widely adopted [6]. To guarantee that every population segment has fair access to telemedicine services, legislative interventions and focused education are essential in addressing these inequities [9,10].

Notwithstanding these drawbacks, the results add to the increasing amount of data that telemedicine may be an effective technique for enhancing the management of chronic illnesses. The research's findings add to the current conversation on telemedicine's integration into regular treatment for chronic illnesses by highlighting the need for more research, governmental support, and the development of healthcare infrastructure in order to fully realise the advantages of this practice on a broader scale.

Conclusion

In conclusion, this retrospective research shows how telemedicine might improve the treatment of chronic illnesses in measurable ways. The results demonstrate its potential to enhance treatment compliance, lower healthcare use, and improve health outcomes for those with long-term diseases. These findings support the

benefits of telemedicine integration into standard treatment, despite certain caveats. In order to fully realise the revolutionary promise of telemedicine, it is vital that research, funding, and initiatives to alleviate inequities continue. In the end, broad adoption of it has the potential to greatly enhance healthcare quality and accessibility for those with chronic illnesses.

References

1. Whittaker R, McRobbie H, Bullen C, Borland R, Rodgers A, Gu Y. Mobile phone-based interventions for smoking cessation. Cochrane Database Syst Rev. 2012 Nov 14;11:CD006611. doi: 10.1002/14651858.CD006611.pub3. PMID: 23152235.
2. Bashshur RL, Howell JD, Krupinski EA, Harms KM, Bashshur N, Doarn CR. The Empirical Foundations of Telemedicine Interventions in Primary Care. *Telemed J E Health*. 2016;22(5):342-375. doi:10.1089/tmj.2016.0045
3. Chaudhry SI, Mattera JA, Curtis JP, Spertus JA, Herrin J, Lin Z, Phillips CO, Hodshon BV, Cooper LS, Krumholz HM. Telemonitoring in patients with heart failure. N Engl J Med. 2010 Dec 9;363(24):2301-9. doi: 10.1056/NEJMoa1010029. PMID: 21105853.
4. Polinski JM, Barker T, Gagliano N, Sussman A, Brennan TA, Shrank WH. Patients' satisfaction with and preference for telehealth visits. J Gen Intern Med. 2016 Feb;31(3):269-75. doi: 10.1007/s11606-015-3489-x. PMID: 26438313; PMCID: PMC4762848.
5. Pare G, Jaana M, Sicotte C. Systematic review of home telemonitoring for chronic diseases: the evidence base. J Am Med Inform Assoc. 2007 Jan-Feb;14(3):269-77. doi: 10.1197/jamia.M2270. Epub 2007 Feb 1. PMID: 17259615; PMCID: PMC2244885.
6. Shaw RJ, Steinberg DM, Bonnet J, Modarai F, George A, Cunningham T, Mason M, Shahsahebi M, Grambow SC, Bennett GG, Bosworth HB. Mobile health devices: will patients actually use them? J Am Med Inform Assoc. 2016 May;23(3):462-6. doi: 10.1093/jamia/ocv183. Epub 2016 Jan 6. PMID: 26740457; PMCID: PMC4954615.
7. Nightingale R, Hall A, Gelder C, Friedl S, Brennan E, Swallow V. Desirable Components for a Customized, Home-Based, Digital Care-Management App for Children and Young People With Long-Term, Chronic Conditions: A Qualitative Exploration. *J Med Internet Res*. 2017;19(7):e235. Published 2017 Jul 4. doi:10.2196/jmir.7760
8. Whitehead L, Seaton P. The Effectiveness of Self-Management Mobile Phone and Tablet Apps in Long-term Condition Management: A Systematic Review. *J Med Internet Res*. 2016;18(5):e97. Published 2016 May 16. doi:10.2196/jmir.4883
9. Nguyen AD, Baysari MT, Kannangara DR, et al. Mobile applications to enhance self-management of gout. *Int J Med Inform*. 2016;94:67-74. doi:10.1016/j.ijmedinf.2016.06.021
10. Safford MM, Russell L, Suh DC, et al. How much time do patients with diabetes spend on self-care? J Am Board Fam Pract. 2005;18(4):262–270